Mercury (Hg)

Element 80 — Complete Summary

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80
Hg
Mercury
200.592

Key Properties

Atomic Mass	200.592
Category	Transition Metals
State at 20°C	liquid
Melting Point	−38.829°C
Boiling Point	356.619°C
Density	13.534
Electron Config	[Xe] 4f145d106s2
Electronegativity	2.0
Year Discovered	Ancient
Discovered By	Unknown

✨ Did You Know?

1. It is the only metallic element that is liquid at standard conditions for temperature and pressure.
2. Its chemical symbol, Hg, comes from its Greek name, 'hydrargyrum', which means 'water-silver'.
3. Mercury was used in early thermometers and barometers because it expands and contracts uniformly with temperature and pressure changes.
4. The phrase \
5. Mercury is a potent neurotoxin that can bioaccumulate in the food chain, which is why there are warnings about eating too much of certain types of fish like tuna and swordfish.

APPEARANCE
Mercury is a heavy, silvery metal that is liquid at room temperature.

SUPERHERO PERSONA
"The Quicksilver, a fluid hero who is both a beautiful liquid metal and a potent toxin."

EVERYDAY CONNECTION
Mercury is found as the liquid in an old glass thermometer.

POP CULTURE
Mercury's toxicity inspired the "Mad Hatter" from Alice in Wonderland, who was poisoned by mercury in his trade.

Overview of Mercury

Mercury is a silvery-white, heavy metal with atomic number 80. It is unique as the only metal that is liquid at room temperature, giving it the nickname quicksilver. Fascinating and widely used for thousands of years, mercury is also highly toxic, and most of its traditional applications have been phased out or tightly controlled.

Uses of Mercury

Despite its toxicity, mercury's unusual properties make it useful in specific, mostly industrial applications:

Chemical industry: Mercury is still used in certain chemical processes and specialized electrical switches and rectifiers. Historically, it played a major role in the electrolysis of brine to produce sodium hydroxide and chlorine, though this use is now declining.

Alloys (amalgams): Mercury readily forms alloys with other metals. This made it valuable in gold extraction during historic gold rushes and in dental fillings, though safer alternatives are now preferred.

Pigments: Mercuric sulfide (HgS), also called vermilion, has been used for centuries as a brilliant red pigment. Today, its use is highly restricted due to mercury's toxicity.

Natural Abundance and Production of Mercury

Mercury is rarely found in its native metallic form. Instead, it occurs mainly in the mineral cinnabar (HgS).

Extraction: Mercury is obtained by heating cinnabar ore in air and condensing the vapor.

Production: Today, most commercial mercury comes from deposits in China and Kyrgyzstan, though global production has been significantly reduced due to health and environmental concerns.

History of Mercury

Ancient pigments: Humans have used cinnabar pigments for over 30,000 years, as seen in Paleolithic cave paintings.

Extraction of the metal: Ancient civilizations learned to heat cinnabar to release liquid mercury, which was then used in gold recovery from sediments.

Mining centers: For centuries, the Almadén mine in Spain supplied most of Europe's mercury. During the colonial era, large cinnabar deposits in Peru and later the California Gold Rush made mercury essential in gold production.

Biological Role of Mercury

Mercury has no biological role and is considered highly toxic. While trace amounts can be tolerated, compounds such as methylmercury accumulate in the food chain, particularly in fish, and pose significant health risks to humans. Mercury exposure can damage the nervous system, kidneys, and other organs.